

E. SCHNEIDER.
 MEANS FOR IMPROVING THE EFFICIENCY OF HOT AIR OR EXTERNAL COMBUSTION MOTORS.
 APPLICATION FILED SEPT. 30, 1908.

973,221.

Patented Oct. 18, 1910.

Fig. 1

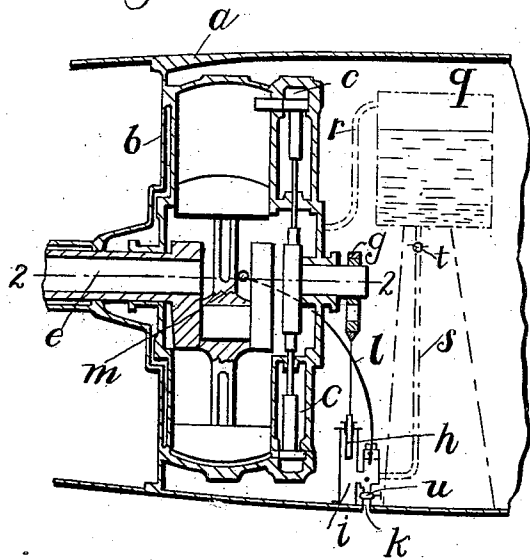


Fig. 2.

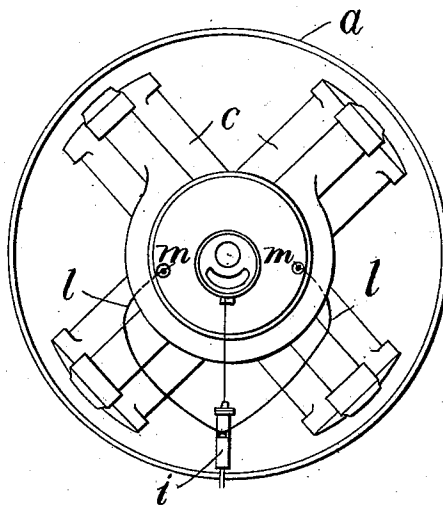


Fig. 3.

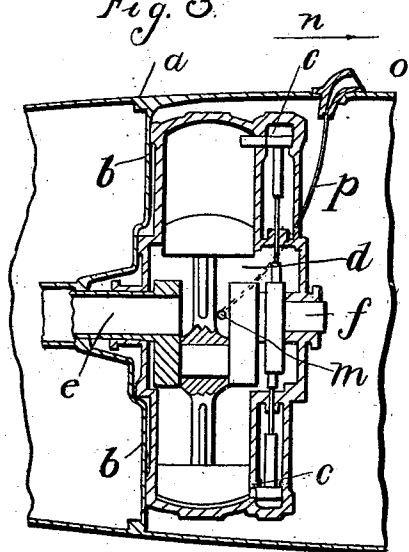


Fig. 4.

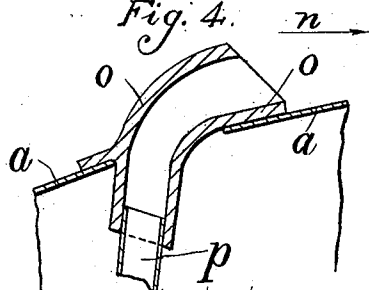
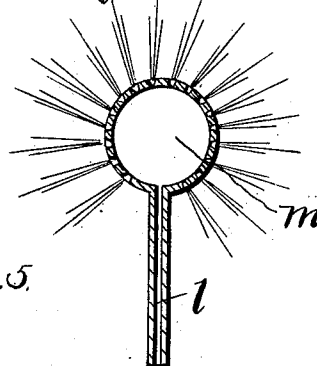


Fig. 5.



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UNITED STATES PATENT OFFICE.

EUGÈNE SCHNEIDER, OF LE CREUZOT, FRANCE.

MEANS FOR IMPROVING THE EFFICIENCY OF HOT-AIR OR EXTERNAL-COMBUSTION MOTORS.

973,221.

Specification of Letters Patent.

Patented Oct. 18, 1910.

Application filed September 30, 1908. Serial No. 455,456.

To all whom it may concern:

Be it known that I, EUGÈNE SCHNEIDER, of Le Creuzot, Saône-et-Loire, France, have invented a new and useful Means for Improving the Efficiency of the Motors of Hot-Air Automobile Torpedoes, which is fully set forth in the following specification.

The present invention relates to means for improving the efficiency of hot air or external combustion motors, and for propelling automobile torpedoes.

The invention consists in principle in injecting water into the space into which the gaseous mixture is discharged after it has performed its work in the motor, the result of this injection of water being the condensation of a part of the products contained in the mixture, the cooling of the other part of the products and consequently a simultaneous diminution of the temperature and of the pressure of the exhausted products the consequence of which is an increase in the efficiency of the motor.

Two embodiments of the invention are illustrated by way of example in the accompanying drawing.

Figure 1 is a longitudinal sectional elevation of one constructional form. Fig. 2 is a view partly diagrammatic and partly in end elevation of Fig. 1. Figs. 3 and 4 represent in general sectional elevation and in partial detail section, respectively, another constructional form of the means embodying the invention, and Fig. 5 is a sectional detail view of a spray nozzle.

a is the shell of the automobile torpedo, b the partition to which the motor is fixed; the motor c here represented is of the Brotherhood type with three or four single acting cylinders and a single crank, the gaseous products being exhausted into the central chamber d of the motor and leaving the torpedo through the passage e formed inside the shaft carrying the propellers.

Figs. 3 and 4 represent in general sectional elevation and in partial detail section, respectively, another constructional form of the means embodying the invention.

In the case of a motor of the type under consideration the water may be injected into the chamber d by utilizing, for example, the device illustrated in the drawing and hereinafter described; upon the prolongation f of the portion of the shaft situated in front of the motor there is keyed an eccentric g

which actuates the piston h of a suction and force pump i which draws water taken from the sea at k through the shell of the torpedo. The forcing takes place through one or more pipes such as l which open into the chamber d and are provided at their extremity m , in the chamber d , with a device of any suitable kind which is capable of reducing the water injected to the form of a spray.

In the device described it is assumed that the water injected is obtained from outside the torpedo the suction orifice being arranged in such a manner that the admission of the water is facilitated by the travel of the torpedo; the water injected is therefore sea water. In cases in which it is preferred to inject fresh water into the crank casing a fresh water tank may be provided in the torpedo from which the water may be pumped. For this purpose, tank q , which may occupy any convenient position within the torpedo casing, is connected near its top by a tube r with the crank casing of the engine. A second conduit 3 provided with a valve t leads from the bottom of the tank to the pump i which delivers to the crank casing through a pipe l having a spray nozzle m . This nozzle is shown in enlarged section, Fig. 5. For the purpose of cutting off supply of sea water to the pump through inlet k while pumping from tank q , a valve u is provided for the purpose, a special reservoir (not shown in the drawing) filled with water before the torpedo is launched may be provided, its upper part being placed in communication with the chamber d in such a manner that the pressure in the two is equal; its lower part is connected with the suction chamber of the pump i .

The pump i may be operated either in the manner represented in the drawing or in any other convenient mechanical manner, with or without modification of the ratio of the respective speeds of the motor or of the pump. The pump might equally well be driven by a special motor entirely independent of the principal motor and supplied with compressed and heated air.

The pump i has been assumed to be a suction and force pump but it might be replaced by a pump of any kind adapted for reciprocating or rotary movement and driven by the principal motor or provided with independent operating means.

In the embodiment of my invention shown

in Figs. 3 and 4, it is unnecessary to use a pump and the water intended to be pulverized at a suitably selected point in the exhaust of the motor is taken from the sea in utilizing the travel of the torpedo itself. A part *o* is fixed at a place on the shell *a* of the torpedo (preferably at its upper part); this part forms a scoop which the sea water enters when the torpedo is traveling at high speed in the direction indicated by the arrow *n*. This water is conducted through a pipe *p*, forming a continuation of the part *o*, to the point where it is pulverized and injected into the gaseous mixture that has performed its work in the motor.

Fig. 3 illustrates the adaptation of the device to a motor of the Brotherhood type; Fig. 4 is a section through the scoop *o* on a larger scale.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In combination, an automobile torpedo casing, one or more external combustion motors for propelling the same and having a single crank casing for receiving the exhaust gases, said crank casing being provided with an under-water exhaust outlet and means for spraying water into the hot gases exhausted into the under-water outlet, thereby reducing pressure on the atmosphere side of the piston during both strokes.

2. In combination, an automobile torpedo casing, an external combustion motor therein for propelling the same and having a crank casing for receiving the exhaust gases from the motor, said crank casing being provided with an under-water exhaust outlet, a spraying device opening into said crank casing and a pump operated by said motor for delivering water to said device, thereby reducing pressure on the atmosphere side of the piston on both strokes.

3. In combination, an automobile torpedo, an external combustion motor therein for propelling the same and having a crank casing for receiving the exhaust gases from the motor, said crank casing being provided with an under-water exhaust outlet, a fresh water supply carried by said torpedo, a spraying device opening into said crank casing, and a pump operated by said motor for delivering water from said supply to said spraying device, and thereby reducing pressure on the atmosphere side of the piston during both strokes.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

EUGÈNE SCHNEIDER.

Witnesses:

R. DE SEVELINGER,
M. BECIUS.